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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/797,004

03/11/2004

Benjamin Herzhaft

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10/16/2007

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

AKRAM, IMRAN

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

10/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/797,004

Applicant(s)

HERZHAFT ET AL.

Examiner

Imran Akram

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 4,904,603) in view of Kelley (US 4,299,794).

Regarding claim 1, Jones discloses a method for penetrating a geological formation by a well drill from the surface having a drilling fluid (mud) that travels from the formation to the surface (column 1, lines 8-20); a drilling fluid having a pH greater than 8 (see Figure 13); and a given quantity of return fluid sampled at the surface, transferred to a cell, and measured for pH (column 5, lines 42-65). Jones does not disclose, however, acidifying said fluid to a pH of less than 4 to measure the CO₂ level of the gas in the cell and in the geological formation. Kelley discloses a system for measuring the carbon dioxide level of the gas in a cell by acidification (column 1, lines 55-68) with a solution of pH less than 3.0 (column 2, lines 40-42). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide means for sampling CO₂ of a geological formation. The annular gas pressure and contents are very important to drilling procedures and well known in the art to be. The invention of Kelley is one such method for detecting CO₂. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding claim 2, Jones discloses taking into account the quantity of carbonate supplied by the geological formation and/or by the additives by choosing an appropriate pH (see column 9, lines 18-20).

Regarding claim 3, Kelley discloses a reaction mixture with pH of approximately 2 (see column 2, lines 40-42).

Regarding claim 6, Jones discloses a method wherein the sampling rate is determined according to the fluid travel rate (see column 13, lines 17-22).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 4,904,603) and Kelley (US 4,299,794) as applied to claim 1 above, and further in view of Allison (US 4,397,957).

Regarding claim 4, Jones and Kelly do not disclose an inert gas scavenging the internal space of the cell. Allison, however, discloses an inert gas sweeping an internal cell for CO₂ detection (see Abstract). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an inert gas to sweep the inside of the cell as evacuation of impurities is necessary to obtain accurate CO₂ readings and an inert gas will not react with any constituents. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 4,904,603) and Kelley (US 4,299,794) as applied to claim 2 above, and further in view of Fehder (US 4,994,117).

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Regarding claim 5, Jones discloses taking into account the quantity of carbonate supplied by the geological formation and/or by the additives by choosing an appropriate pH (see column 9, lines 18-20). Jones does not disclose, however, acidifying said fluid to a pH of less than 4 to measure the CO₂ level of the gas in the cell and in the geological formation. Kelley discloses a system for measuring the carbon dioxide level of the gas in a cell by acidification (column 1, lines 55-68) with a solution of pH less than 3.0 (column 2, lines 40-42). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add acid to drilling mud that has a pH meter to detect carbon dioxide because detection of carbon dioxide in geological formations is possible (as disclosed by Kelley, column 2, lines 20-22) and the means to do so known well in the art (as disclosed by Kelley, column 1, lines 38-39). Neither Jones nor Kelley discloses running the CO₂ measurement method on a given volume of initial fluid before contact with the formation. Fehder, however, does disclose a baseline concentration of carbon dioxide (column 6, line 52). It would have been obvious to one having ordinary skill in the art at the time the invention was made to measure the initial concentration of CO₂ to determine a baseline as the initial concentration is a necessary measurement to determine the change in concentration. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

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8. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 4,904,603) in view of Kelley (US 4,299,794) and in further view of Allison (US 4,397,957).

Regarding claim 7, Jones discloses a device for penetrating a geological formation by a well drill from the surface having a drilling fluid that travels from the formation to the surface (see column 1) with a drilling fluid having a pH greater than 8 (see Figure 13); a cell to hold said quantity of liquid (see 12 in Figure 1) with an injection system (column 6, lines 9-13); and means for sampling a given quantity of return fluid at the wellhead and means for measuring for pH (see column 5) Jones does not disclose, however, means for acidifying product into said cell and means for measuring the quantity of CO₂ contained in the cell. Kelley discloses a system for measuring the carbon dioxide level of the gas in a cell by acidification (column 1, lines 55-68). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add acid to drilling mud that has a pH meter to detect carbon dioxide because detection of carbon dioxide in geological formations is possible (as disclosed by Kelley, column 2, lines 20-22) and the means to do so known well in the art (as disclosed by Kelley, column 1, lines 38-39). Neither Jones nor Kelly discloses means for inert gas scavenging of the internal space of the cell. Allison, however, discloses means for an inert gas sweeping an internal cell for CO₂ detection (see Abstract of Allison). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include inert gas sweeping means in the inside of the cell as evacuation of impurities is necessary to obtain accurate CO₂ readings and an inert gas will not react

with any constituents. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding claim 8, Jones discloses control means for drilling by monitoring pH (see column 3, lines 37-42). Jones does not disclose, however, acid injection control. Kelley discloses a controller for the cell (see **204**, Figure 7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use said controller for acid injection since the Jones reference discloses control for monitoring pH and acid injection would be a commonly known way to do so.

Regarding claim 9, Kelley discloses means for measuring the quantity of CO₂ by an infrared cell (see column 1, line 68 through column 2, lines 1-2).

Regarding claim 10, Jones discloses control means for drilling and sampling by monitoring pH (see column 3, lines 37-42). Kelley discloses a controller for operations within the cell (see **204**, Figure 7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use said controller for all of steps listed in claim 10. The rate, by definition, is determined by the fluid flow rate and is in Jones (see column 13, lines 17-22).

Regarding claim 11, Kelley discloses a means for measuring the internal pressure of said cell (column 2, lines 4-9).

Regarding claim 12, Jones discloses means for measuring the temperature of said cell (column 3, lines 48-50). Applicant does not disclose specific means for

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regulation. The ability to measure temperature and the inclusion of control mechanisms in Jones includes the ability to regulate temperature according to applicant's means for language.

Response to Arguments

1. Applicant's arguments filed 8/31/07 have been fully considered but they are not persuasive.
2. Applicant agrees with examiner that references teach all the disclosed limitation of applicant's claims, but argues that no motivation is provided by the references to combine the references. In fact, all traversals are based upon a lack of motivation to combine.
3. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or *in the knowledge generally available to one of ordinary skill in the art*. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).
4. All the factual inquiries of *Graham v. John Deere* are included in the original rejection. The scope of the art includes the references: applicant acknowledges Kelley discloses use in industrial processes (column 2, lines 20-23), not solely the particular embodiment of micro samples. All the limitations of the claims are disclosed by the

references (see rejections above). And a person of ordinary skill would deem the advantages attempted by applicant obvious without impermissible hindsight for the following reason: The annulus gas contents of a geological formation are crucial when drilling using drilling muds. CO₂ is a commonly occurring, underground gas which has the potential to be very much disruptive to the drilling process—as one skilled in the art knows well, this is a primary motivation to use drilling fluids at all (Jones teaches this). Various methods of detection during for this process exist and Kelley is one such known method. Kelley discloses an embodiment on a micro-scale, but also discloses the ability to apply on the process on a macro scale such as that of Jones.

5. According to *KSR International Co. v. Telefax Inc.*, combining prior art elements using known methods when doing so would yield predictable results is grounds for an obviousness-type rejection. In this particular case, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

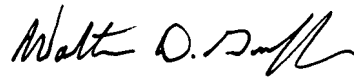
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Imran Akram whose telephone number is 571-270-3241. The examiner can normally be reached on 9-5 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to read "Walter D. Griffin". The signature is fluid and cursive, with the first name "Walter" being more legible than the last name "Griffin".

WALTER D. GRIFFIN
SUPERVISORY PATENT EXAMINER